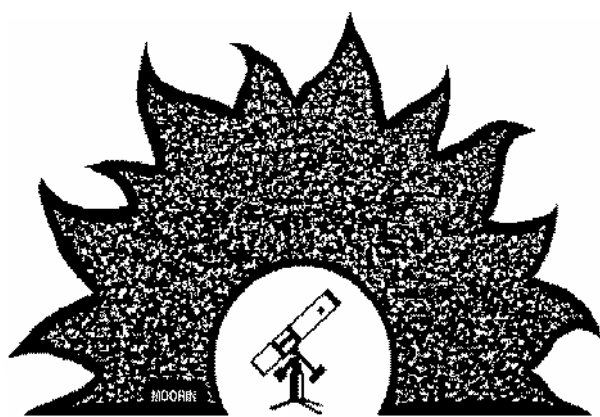




PAStimes

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Next PAS meeting March 6

The meeting will start at the normal time of 7:00 with a half hour of fellowship time. The actual meeting will start at 7:30 and snacks and drinks would be appreciated, PAS will provide bottled water

Steve Coe of Saguario Astronomy Club will be our speaker. His topic is "Nebulae, observing and enjoying the clouds among the stars." I am sure you will enjoy his talk and I hope to see everyone at the meeting Thursday March 6.



Meeting of the Minds Review 1/31

By Terri, Events Coordinator

It was an interesting meeting. We got done with it by 9pm. Surprised? Well, what surprised me is that we only had in attendance: Chet, Mike, Rod, Terri, Sue, and Dave. So, the 5 of us made all the decisions. If you had planned to decide something this night and didn't make it, and you don't like what we decided, tough! You weren't there.

Let me review what we decided so that we are all on the same page. We talked about the PAS Book. Originally Rod thought it would be a great idea to make a PAS book that we could sell for a small profit over our initial investment. However, he did some research and at 100 copies of the book, through the website we were going to go through, it would be \$15.90 per book. We can't sell it at that price, so we decided on other methods. Then we discussed, have Leah do the printing, she can even up her price to 2 cents a page, to help defray costs, and maybe have Bruce do the spiral binding, again offering him a little compensation for his time. Then, the idea

was brought forth, how about a book on CD? So, right now, we are in the planning stages of the book, which will be discussed at the next MOM after the Feb Party MOM. So, March MOM, plan to attend and if you want to be involved in this PAS book idea, I think it would be awesome to have as many PAS members write for the book. Oh, the idea? You just had to ask... well, what we have in mind is that everyone gets to write a chapter for the book. Anything astronomy related. For instance, Mike might want to write about his meteorite collection, or Chet might want to write a chapter about imaging. Just some ideas, not the actual topics for those people. Then we make a book of it, and put it on CD. What's cool about the CD idea is that we can expand it anytime. Have one person, or maybe 2 for back up purposes, house the book on their computer, the original, and then make copies as we need to. Maybe sell it for \$5 a CD. The CD itself would only be about 10 cents in cost to PAS. The people duplicating it would be donating their time. So, Rod,

Chris, Terri, and Don could do some of the duplication, maybe 20 copies each, giving us enough copies to start with and as needed, make more. So, be thinking about what topic you wish to include in the PAS book. The other thing I think we should put on that same CD is the Who are we page, and a few choice docs from our website maybe, about PAS, like the history page. Since it is ABOUT PAS as well as done BY PAS, I think we should include some info in that respect. So, come to the March MOM's and give your input and maybe a topic you wish to write about. There is no set date for publication just yet. Let's see what we get. I'd like to also include photos of PAS stuff, and Rod said something about borrowing star charts from various sites to include, so it becomes not only a Book by PAS but a useful tool, and printable stuff, so say, if we were doing the 12 months of the year in star charts, we could include that and some key info about the night sky. Maybe Leah wants to include a year's worth of observing tips that she already wrote about, in her really

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PAS SOCIAL 2008

What a party! Did you attend? You should have..... We had a blast. I wish to thank those attendees who not only attended but brought food, enjoyed the fun, won the prizes and were there with us for the party: Merryll & Carl were very important in reserving The Clubhouse for us. These are Rod's parents. Thank you, both! Attendees were: Rod & Sue, William & Terri, Ed & Bette, Bruce with Cherie, Don, Chris, Chet & Jewel, Mike with Lynn, Jerry, Frank & Sam. Arriving right as we were cleaning up was Mark with his girlfriend.

We began by eating. When everyone had filled their tummies, we started the dart game. Part way through the dart game we started the Table Decoration game. While the dart game continued, I tallied the votes for the Table Decoration game, and then when all was finished and we had our winners, we moved to our circle and played our White Dwarf Gift Exchange Game. Matt and Chet & Jewel left gifts to be exchanged, but were not present for the game. In the White Dwarf, Mike won an astronomy puzzle. He said it will be very good for him and his parents to play while they are in town. Rod won Binoculars and a bag brought by Jerry. Bette won a Rocket Kit brought by Mike. Ed won a year in Space Calendar which he passed along to Cherie. Sam won a Moon in my Room brought by the Finches. Then Frank won Einstein and couldn't stop laughing, also donated by the Finches. The idea was that Chet was going to win the Einstein action figure, but Chet and Jewel had to leave early. Terri won a 3D Projector. William won a Issac Asimov Voyage to the Outer Planets VHS. Cherie won HR Ray

Stars. Bruce won a Laser Pen, a meteorite, a Tecktite brought by Mike. Jerry won a cool looking coat rack, or it might have been a Key chain holder. Lynn won Books. One prize was kept out for Matt (delivered by Jerry) and one for Chet (delivered by Rod).

We then did the awards For the Dart game 1st place went to Bruce. He won a bag with binoculars and darts and a dart rack, donated by Jerry. He also got a really awesome 1ST PLACE Trophy. This was very beautiful! 2nd place went to Rod and he got the 3 Celestial Handbook set donated by Kevin. 3rd Place went to Mike who got a knife. The knife was later swapped with Frank for the Einstein doll. Cherie took last place and so she won the Dart board and darts so she could practice up. She gave that to Bruce to hang on to and we can practice with her at Bruce's some nights.

The Table Decor game was awesome this year. 1st place went to Chris. At the last minute, I convinced Chris to enter his lap-top showing the celestial photos he took. He was awarded with an angel lap. 2nd place went to Jerry. Jerry brought a beautiful gold table top telescope and a huge, tall rocket of his. His prize was a statue of Nefertiti. 3rd place went to Kevin. Kevin had made, artistically, a solar sail. He won a knife as his prize. The other entries were a Globe of the world with a rocket attached to it by the Sutters. I brought a basket that was decorated with Stars and Moons, and in it was one large star and one moon, plus a candle in a candle holder burning, and the candle holder was a star and moon pattern too. The

Wursts brought a talking Christmas Tree, Douglas Fir. It was the hit of the night. Don put his Dart Board into the table decor contest. Sam and Frank brought a space man set. Chet brought a star projector that he won last year.

We had great food too. There was string bean casserole, rotisserie chicken, chips, and this year William made a special dip. It was a Queso dip, instead of his normal, but it was HOT like usual. He made a mild version too for those who wanted some but didn't want the heat. We also had plain and peanut butter rice crispie treats and Chocolate Peanut Butter candy I made, and little smokes that Sue made. It was all yummy!

The door prizes: Chet took first drawing, and since he had left we awarded him with the last prize on the table to be delivered with his White dwarf prize by Rod at a later time. It was a Year in Space Calendar. Second prize: William won a knife. Lynn won the bag. Chris took 4th place, and He won a box of 3 candles.

If you missed this year's party, please plan to make it to next year's event. It will be scheduled for one of the Saturday's in January 2009 and it will be a different location. We were lucky to get this location again this year because Rod's parents still technically live there. But they have sold their home and have moved, and so we will NOT be at The Club House next year. We are considering Chris's home in Goodyear. Or, if someone has another suggestion, please let us know so we can start planning for it. Enjoy the photos, and see more of them on line at

<http://tinyurl.com/34t896> and

<http://tinyurl.com/2n8tm7d>

http://gallery.mac.com/ozy311/100103***





Meeting of the Minds Review 1/31

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awesome ARIZONA SKY column, leaving out maybe the planetary info since that changes each year. That could be her chapter, or in that case, maybe chapters. These are just idea. If you like what you have read, come to the meeting and let's discuss it further. We will be setting a deadline for the first edition of the CD, or Book, if we decide to go that route.

Reminder: Feb MOM is a PARTY. Bring a snack & help assemble 500 bags of goodies for the Girl Scouts in Mayer! Your help is requested, and your attendance is a must to enjoy snacking and chatting. We won't be discussing anything except the Mayer event. We may have a few quick topics to cover before we stuff the bags, but the topics will all be about the Mayer event.

Star Party 2/14 at PVCC - The new 16" telescope at PVCC will see FIRST LIGHT on this night. Come view through the new telescope with us! RSVP with Rod.

January Meeting to have a Speaker or Members Night. It was voted on to have a speaker for the January meeting so for Jan 2009, I will be finding a speaker to do a presentation for PAS. If you have someone in mind, please let me know.

Also, Summer speaker, we decided to have a summer speaker, and I have to contact them and see if they are free for a special presentation on June 19th. Watch for an announcement of this speaker and their topic in future newsletters.

And Mike: Mike's 2 talks for April and May are scheduled, and I believe I put that info in the Feb newsletter. Now we have

the Summer schedule and Mike would like to repeat his performance of last summer and hold 3 star parties at his home which include a lecture. The dates for these events will be June 28, July 2 with fireworks, and Aug 30. Remember to RSVP with Mike if you plan to attend. Watch for their announcement and topics in future issues of this newsletter.

And then the main topic of the night was the change in the MOM location. We were informed by Dave that we are losing the use of PVCC G-147 for our MOM's meetings on Thursday night. Since Monday is not a good day for most folks, and Friday most people who have a telescope would rather be observing than at a meeting, even if it is full moon night, and we have school star parties on Fridays, Rod and I agree, and the rest of the group agree, we are going to hold off on making a decision where to hold the meetings until closer to summer. But, Dave said we can possibly hold them in a normal class room, right there in the same building. He won't know which one will be free at that time for another couple months when the PVCC Schedules come out, but once he does, as long as we have a class room to meet in the meeting will continue to be at PVCC. If that falls through, we will want to start looking into a restaurant we can meet at, because that was a good idea before PVCC helped out. So, watch for announcements of change of location for the MOM's.

The PAS Meeting are not moving. We will still hold them in the Library on the first Thursday of the month.

And last but not least, Rod was showing us his Blog. He made a really cool PAS blog. He is the one posting to it right now. But William said he could find me a blog to move my PAS Digest to. One in which people can sign up and leave anytime they wish to. So, in the next few months we will be moving the PAS Digest, possibly, to a blog so that those who want to see and know what PAS is doing, will be able to. And we will link all of these items on the website for those who wish to check out what is posted. Rod's Blog is WHAT'S UP TONIGHT items. It is very interesting and he tries to post to it every night. I would be posting stuff that is sent to me, links etc, as they come in, or thoughts, like this whole article could go in there if I wanted, and then have it dispersed to the readers through their email. So, the PAS digest is going to be moving. If you aren't on the list and want to be so you know if something is canceled, or changed, or an update of interesting info that comes my way shared by the membership and guests of PAS, then when I move things over, let me know to put you on the list.

The meeting went smoothly, and we had a great discussion, and could take our time talking about topics because there were fewer of us to add input. However, your attendance is really requested for the Feb MOM's. See you there! ***



Arizona Sky

By Leah Sapir

The winter circle is moving towards the west, and the spring constellations of Leo and Ursa major are now high in the east.

The “Big Dipper” is easy to recognize in Ursa major. Actually the dipper is just an asterism, since it is only part of the constellation. The Big Dipper can help us locate some of the other, less-obvious constellations – it is our “big signpost in the sky”.

The stars of the Big Dipper are interesting for another reason: many of them are part of Collinder 285, “The Ursa Major Moving Cluster”. This is an open cluster only 75 light years away; in fact, it is so close that the members of the cluster appear widely-spaced in our sky. We can recognize them as a cluster due to their “proper motion” – they all seem to be moving through space at the same speed and direction. (Watch out! The cluster is approaching us at 10 km/sec – which means that it should be arriving in our neighborhood in around... 2 million years. Practically a blink of an eye, in astronomical time...)

Collinder 285 is about 30 light years across and includes about 17 stars, including all the stars of the Big Dipper except for the two at the ends; as well as 37 Ursa majoris, 78 Ursa majoris, and a few stars in nearby constellations. Even a few stars in other parts of the sky – such as Sirius, Alpha Ophiuchi, Delta Leonis and Beta Aurigae – have a similar motion through space, and could be former members of Collinder 285 that gradually drifted away from the rest of the cluster. The stars of Collinder 285 are estimated to be about 160 million years old – practically youngsters, compared to our sun’s age of 4.6 billion years.

Some of the cluster’s stars are multiple stars, and some are “optical binaries” – stars that are not really part of a single system, but just in the same line of sight from our point of view. With good eyesight, or through binoculars, we can see that the middle star of the Big Dipper’s handle is actually two stars: Alcor and Mizar. They are sometimes called “the horse and rider”,

and in the past have been used as a test of vision. The two are probably just an optical binary. Mizar, the brighter one, is estimated to be

78 light years from us, and Alcor 81 light years – which would place them 3 light years apart, too far to be gravitationally affected by each other. But, through a telescope we can see that Mizar is actually two stars. Mizar was the first star to be recognized as a binary, when Galileo and one of his students observed its two components in 1617. It was later found that each of Mizar’s components is a spectroscopic binary: a pair of stars so close, that only its spectrum shows that it is two stars instead of one. So, looking at Alcor and Mizar we are actually seeing five stars.

In the same field of view with Alcor and Mizar, we can see an additional, fainter star, that makes an almost-isosceles triangle with them. (It’s a little closer to Alcor.) In 1772, a German mathematics professor named Johann Liebknecht observed this star and mistakenly thought he saw it moving. Despite its distance from the ecliptic (the region of the sky where the sun, moon and planets are usually found – representing the plane of the solar system), he promptly decided that it was a new planet, and named it “Sidus Ludoviciana” (Ludwig’s star) after the German king Ludwig V. Today, 230 years later, the supposed planet still hasn’t moved. Sidus Ludoviciana is not related to Alcor and Mizar, and is not part of the Ursa Major Moving Cluster. It is a background star about 400 light years away,

The four stars of the Big Dipper’s bowl are (clockwise from the outer corner): Alpha (“Dubhe”), Beta (“Merak”), Gamma (“Phad” or “Phecda”) and Delta (“Megrez”). Dubhe and Merak are also known as the “pointer stars”: a line from Merak through Dubhe points to Polaris, which is about as bright as the pointers themselves. The height of Polaris above the horizon is equal to the latitude that you are observing from. Here in Arizona, that is around 33 degrees.

Polaris is always in the same place in the sky, so once you’ve located it, it’s easy to find again. That’s because it’s the North Star – the earth’s axis is pointed right towards it. But, Polaris wasn’t always the North Star. Over thousands of years, the earth’s axis sort of wobbles, like a spinning top, in a process called “precession”. Four thousand years ago, the North Star was Thuban, in Draco; and in 11,000 years it will be Vega, in Lyra. After 26,000 years, Polaris will again be the North Star.

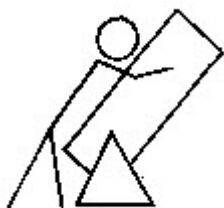
Polaris is at the end of the Little Dipper’s handle. Most of the stars of the Little Dipper are very faint; but just as we followed the “front pointers” to Polaris, we can follow the “back pointers” to the other end of the Little Dipper. A line from Phad through Megrez, extending for about the same distance as Polaris is from the “front pointers”, will reach a pair of stars (Beta and Gamma Ursa minoris, also known as Kochab and Pherkad) that represent the end of the Little Dipper’s bowl. Kochab and Pherkad are about as bright as Phad and Megrez. Once we’ve located these stars and Polaris, we can sometimes find the remaining stars of the Little Dipper. (Dark skies help...)

Starting from the Big Dipper, we can easily trace out the rest of the “big bear” in the sky. The remaining stars of the bear pattern are faint but visible, around 3rd magnitude. Right now, when Ursa major is rising in the northeast, the Big Dipper is standing upright on its handle, which is the bear’s tail. So, the bear’s head will be above the dipper, and the bear’s legs will be at its right. Start from the “back pointers”, Phad and Megrez, and move towards the “front pointers”, Merak and Dubhe. Then move a similar distance to find a fainter pair of stars (23 and 29 Ursa majoris) that represent the back of the bears head; and the same distance again to find a single star (Omicron Ursa majoris) that represents the bear’s nose. To the right of 23 and 29 UMa is a single star (Theta Ursa majoris), and to the right of Omicron, and a little farther away, is a pair of stars making a long triangle with Theta. This triangle is the bear’s foreleg.

Similarly, to the right of Phad and Megrez is a single star (Chi Ursa majoris) representing the bear’s thigh. A straight line to the right, from Phad through Chi UMa, reaches a pair of stars representing one hind paw, and about halfway between this pair of stars and the first pair (the bear’s front paw) is another pair – three pairs of stars in a row, representing three of the bear’s paws.

The three pairs have another name, too. They are “the three leaps of the gazelle”, Alula, Tania, and Talita (“First, Second, Third”) – the tracks of a gazelle racing across the sky.

The constellation Leo is rising in the southeast, parallel to Ursa major; and next month we will explore it further. But the



Arizona Sky

brightest “star” in Leo right now is Saturn, which will be up almost all night, setting a little before dawn. Mars is also high in the sky, in Gemini, setting at around 2-3 a.m.

Venus and Mercury are still morning stars, but getting closer to the horizon and harder to see; and Jupiter rises earlier every morning: 4 am at the beginning of March and 2 am at the end of the month.

Join us next month as we continue to explore the spring constellations. And till then – wishing you clear skies, and happy observing!

Everyone Had Fun At the Social



March Upcoming Events - We want to see you there!!!

by Terri, Events Coordinator

We end our February with a Meeting of the Minds that is going to be FUN! Feb 28th we will be having a MEETING OF THE MINDS ASSEMBLY PARTY. Bring a snack to share from 7pm to 10pm. We will be assembling the 500 bags needed for the Girl Scout Star Party in Mayer AZ on Apr 12th. BYO Drinks. Your help is needed. The meeting will begin with a brief discussion, maybe the first 1/2 hour will be some needed topics, and then the rest of the night will be assembling and talking and munching and having a blast. Everyone is welcome to join in the fun. Your help is needed.

We start the month with Mar 1 at Sally Ride. Volunteers are needed. RSVP with Terri. The Sally Ride event takes place once a year at ASU in Tempe. We are there from 11am to 4pm. We set up at 10am, and we close down around 3:30pm when all the kids stop visiting our booth. We will have 3 canopies to keep out of the sun. 2 will be up on the top of the hill, and the other one will be for those working solar telescopes down below. We are thinking of playing the same card game as last year where the girls visit our booth, then are told to visit each scope, collect playing cards, and come back to win a prize at the booth. The idea is to have them see all the objects available that day and then get their prize. I would like volunteers to help with handouts and other fun games at our table. Volunteers do not need to bring a telescope if they are helping with the tables. Those joining us with or without scopes are asked to let Terri know you will attend. At the MOM on Feb 28th, we will discuss the details of the games we will play there. Please attend if you can.

March 6th is the PAS meeting. We have an awesome speaker you won't want to miss. See you there. Snacks should be brought, and PAS will buy the drinks.

Mar 7 is the first of 5 Spring WOW Star Parties. Chet is the RSVP. Let him know you can assist. See list of dates and locations, this issue. All Wow Star Parties start at 6pm and go to 9pm. Only PAS Telescopes Operators are asked to help out. No extra folk are needed. There are 2 being held at S. Mountain Park, and 2 at Phoenix Zoo and one at Reach 11 Park. Your help is needed.

Mar 13 we have a Star Party scheduled for PVCC by the Telescope Domes. Set up is 5:30, star party is from 6pm to 10pm. See you there. RSVP is with Rod.

Mar 14 starts the new location for Public Star Parties. We are working with N. Mountain Park Visitor Center to bring a series of lectures and star parties to the area. Your help is requested. RSVP is with Terri and required for attendance. Seating for the lectures is limited. This first star party does not have a lecture, but there are 2 others happening between Mar and May that you may wish to be a part of. The location is 7th Street and Peoria. You turn into the park at that location and go to the Visitor Center. This is open to the public and the first event currently has 8 public RSVP'd. We'd love to see you there! We need your telescope and meteorites!

Mar 15 is a new thing we are trying. We are holding Bookman's Telescope Workshops at Bookman's and while there, we set up a date for our next TELESCOPE TRAINING WORKSHOP. These workshops are held at PV Park from 6pm to 10pm. RSVP is required with Terri. No RSVP cancels this training session. This is where you learn how to use your scope with a little light from the Moon and the Park. Experienced telescope operators are there to assist you in finding what ever is available that night for viewing, through YOUR telescope.

Mar 21 has a Full Moon Star Party at PV Park 6pm to 10pm. This star party is canceled if no RSVP's are received. RSVP is with Terri. Come observe the full moon through telescopes and other brighter objects.

And that brings us to the last March scheduled Item that we know of as of the writing of this article: Mar 27th is the next Meeting of the Minds. We will resume the normal MOM format on this date. No party, but a lot of discussion and fun. See you there!!! ***

BOOKMAN'S TELESCOPE WORKSHOPS ARE TEMPORARILY ENDING

PAS was informed that Bookman's will be renovating their back room, actually

their whole store. And the renovation starts in April. So, they have informed us that we are no longer using the back room from April 1st, on into the future. So, until further notice, all Bookman's events are canceled after March. So the LAST Bookman's telescope workshop will be on Mar 30 4:30pm to 6:30pm. Let's make it a good one. Bring your scope, learn how to use it by daylight, and then join us for dinner at Carlos O'Briens afterwards. If they allow us to use the back room, or even if they have a back room after they renovate, I will get a notice out letting you know we are reinstated the dates of the Bookman's Telescope Workshops. Until then, see you at the LAST one until further notice. Thanks for your understanding! ***

PVCC INDOOR ASTRONOMY

EVENT 4/10

You won't want to miss this event. Volunteers are asked to let Terri know what you plan to do at this event this year. Guests are asked to RSVP attendance so we know how many will attend. The event set up is 7pm for the volunteers. Guests are asked to arrive and enjoy their hands-on experiences from 7:30pm to 9:30pm. We close up at 9:30. Weather Permitting we will have viewing through several scopes outside by the telescope domes, and possibly through the telescopes in the domes. Plan to attend. All ages are welcome and encouraged to be there. We love sharing astronomy with you. Come enjoy the night with us and learn more about our shared favorite topic!!! ***

SUNSET RIDGE ELEMENTARY SCHOOL STAR PARTY 4/11

Volunteers are needed. Remember this awesome star party last year? Well, they want us back and I want to make sure we have enough scopes to accommodate them. Please RSVP with Terri soon to let her know you are attending to help out. every one is welcome to come to this star party. More details will be in the April Newsletter. See you there!!! ***

WOW Star Party Dates & Locations

Star parties are from 6pm to 10pm.

RSVP with Chet, PAS Telescope operators ONLY.

Date	Location	Address
3/7	South Mountain Park	10409 S. Central
3/14	Phoenix Zoo	455 N Galvin Parkway
4/4	South Mountain Park	10409 S. Central
4/25	Phoenix Zoo	455 N Galvin Parkway
5/2	Reach 11	19224 N. Tatum Blvd.



Invisible Spiral Arms

by Patrick Barry

At one time or another, we've all stared at beautiful images of spiral galaxies, day-dreaming about the billions of stars and countless worlds they contain. What mysteries—and even life forms—must lurk within those vast disks?

Now consider this: many of the galaxies you've seen are actually much larger than they appear. NASA's Galaxy Evolution Explorer, a space telescope that “sees” invisible, ultraviolet light, has revealed that roughly 20 percent of nearby galaxies have spiral arms that extend far beyond the galaxies' apparent edges. Some of these galaxies are more than three times larger than they appear in images taken by ordinary visible-light telescopes.

“Astronomers have been observing some of these galaxies for many, many years, and all that time, there was a whole side to these galaxies that they simply couldn't see,” says Patrick Morrissey, an astronomer at Caltech in Pasadena, California, who collaborates at JPL.

The extended arms of these galaxies are

too dim in visible light for most telescopes to detect, but they emit a greater amount of UV light. Also, the cosmic background is much darker at UV wavelengths than it is for visible light. “Because the sky is essentially black in the UV, far-UV enables you to see these very faint arms around the outsides of galaxies,” Morrissey explains.

These “invisible arms” are made of mostly young stars shining brightly at UV wavelengths. Why UV? Because the stars are so hot. Young stars burn their nuclear fuel with impetuous speed, making them hotter and bluer than older, cooler stars such as the sun. (Think of a candle: blue flames are hotter than red ones.) Ultraviolet is a sort of “ultra-blue” that reveals the youngest, hottest stars of all.

“That's the basic idea behind the Galaxy Evolution Explorer in the first place. By observing the UV glow of young stars, we can see where star formation is active,” Morrissey says.

The discovery of these extended arms provides fresh clues for scientists about how some galaxies form and evolve, a hot

question right now in astronomy. For example, a burst of star formation so far from the galaxies' denser centers may have started because of the gravity of neighboring galaxies that passed too close. But in many cases, the neighboring galaxies have not themselves sprouted extended arms, an observation that remains to be explained. The Galaxy Evolution Explorer reveals one mystery after another!

“How much else is out there that we don't know about?” Morrissey asks. “It makes you wonder.”

Spread the wonder by seeing for yourself some of these UV images at www.galex.caltech.edu. Also, Chris Martin, principle scientist for Galaxy Evolution Explorer—or rather his cartoon alter-ego—gives kids a great introduction to ultraviolet astronomy at spaceplace.nasa.gov/en/kids/live#martin.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



In this image of galaxy NGC 1512, red represents its visible light appearance, the glow coming from older stars, while the bluish-white ring and the long, blue spiral arms show the galaxy as the Galaxy Evolution Explorer sees it in ultraviolet, tracing primarily younger stars. (Credit: NASA/JPL-Caltech/DSS/GALEX).

Astronomy questions from a student, and answers from PAS

Q. Have the aviation and space industry helped us in our everyday lives?

A. Yes – and there is a lot of good information about that on the NASA website! Active research projects by NASA are helping to fight cancer and heart disease, to keep fruits and vegetables clean and germ-free, and even to help police catch criminals!

For example, NASA has developed a way to produce tiny tubes, called nanotubes. The nanotubes are made of carbon, and are thinner than a human hair, but are hollow on the inside. NASA uses them in various electronic equipment; but is also participating in research with the City of Hope cancer treatment center in California, to use the nanotubes to deliver medication to where it is needed, without harming nearby tissues.

In another research project, NASA scientists shared data about the climate and environment, such as the air quality, temperature, and humidity in different locations on earth, measured by satellites. Researchers at the University of Alabama will use the information to see if certain diseases, such as heart disease and stroke, are affected by these environmental factors.

NASA needs to find ways to keep food fresh and germ-free for astronauts. With the help of the Microcide company in Michigan, they have developed a non-toxic disinfectant called “Pro-san”, for rinsing fruits and vegetables. Pro-san is safe for humans, but destroys all germs on the fruits and vegetables within 30 seconds. Pro-san can also be used for sanitizing dishes, utensils, and countertops, in homes, hospitals, restaurants, and other places.

NASA engineers have also helped develop a special spiked strip that will puncture the tires of fleeing criminals so that police can catch them. This “tire deflation

device” is specially designed to keep the spikes attached to the strip unless a car runs over them, so that they will not damage the tires of other cars.

Here is a direct link with more information about these and other projects:

<http://www.nasa.gov/topics/nasalife/index.html>

Q. What is radio astronomy? And what is the big “dish” used for?

A. Light is made of a kind of wave called “electromagnetic waves”. Water waves are made by the motion of water alternately moving up and down; electromagnetic waves are made of an electric field alternating with a magnetic field.

Every wave that you see (whether it is waves in water, or sound waves, or light waves) has a specific wavelength - it is the size of the wave from one “crest” to the next. Different colors of light have different wavelengths. For example, red light has a wavelength of 700 nanometers, and violet light has a wavelength of 400 nanometers. (A nanometer is a very tiny unit of length. It is approximately one 25-millionth of an inch - 1/25,000,000 inch.) When light passes through moist air, the drops of water separate the light according to the different wavelengths and we see a rainbow!

But there are other types of electromagnetic waves that are longer or shorter than visible light. These include: x rays, ultraviolet, infrared, microwaves, and radio waves. The radio dish can focus radio waves and show things that we cannot see in visible light.

There are also space telescopes that can produce images in other wavelengths, such as X rays, ultraviolet and infrared. This

helps us get a more complete picture of the universe.

Here is a page all about the different kinds of electromagnetic waves.

http://imagine.gsfc.nasa.gov/docs/science/known_11/emspectrum.html

Q. How can I learn about a career in astronomy?

A. The NASA website has some very good information about that. Here is a direct link:

<http://www.nasa.gov/audience/forstudents/5-8/career/index.html>

For example, there is the story of Paul Christensen, who developed an instrument called THEMIS (Thermal Emission Imaging System). THEMIS enables the Mars Odyssey spacecraft to determine the composition of Martian rocks, just by analyzing their images in visible and infrared light. It can even find signs of present and past liquid water on Mars!

There is the story of John Mather and George Smoot, who received the Nobel Prize in Physics in 2006. Mather and Smoot designed the Cosmic Background Explorer satellite (COBE), which measured the cosmic background radiation in a detailed way and proved the certainty of the Big Bang theory.

There is the story of Wanda Diaz, who is studying the universe with radio astronomy, even though she is blind. There are also interviews with Laurie Leshin, who directs the science and exploration division at NASA’s Goddard Space Flight Center in Maryland, and with Jaime Dyk, who helped design the robotic rovers that are exploring Mars.

There are many other great stories, just follow the links on the “career” page. And good luck with your future plans!

Bookman's Telescope Workshop 1/27 Review

By Terri, Events Coordinator

Attendance was AWESOME! at the Bookman's Telescope Workshop this Sunday! We gathered in the back room, and it was just enough room to hold the whole collection of RSVp's and PAS Volunteers. We had the help of Chet, Bruce, Rod, Mike, Terri, Bruce. Along for the ride were William and Sue and John Pulis and Kevin and Bette & Ed.

The public RSVP's were Flash & Carol, Jane & Joy, Steve & Dylan with Zoie.

Flash & Carol spent quite a bit of time learning about Meteorites from Mike.

When he finished, Rod helped them by showing different telescopes and pricing on line.

Jane, a member of PAS, brought her friend from Anthem, Joy, and Joy's scope down to find out how to work it. Chet helped them most of the afternoon.

Cherie returned, from last Bookman's event, and had the same scope as Dylan. Bruce and Rod assisted them.

Steve brought his scope but left it in the car. The rain was a bit much, I guess.

John Pulis helped Dylan by taking him

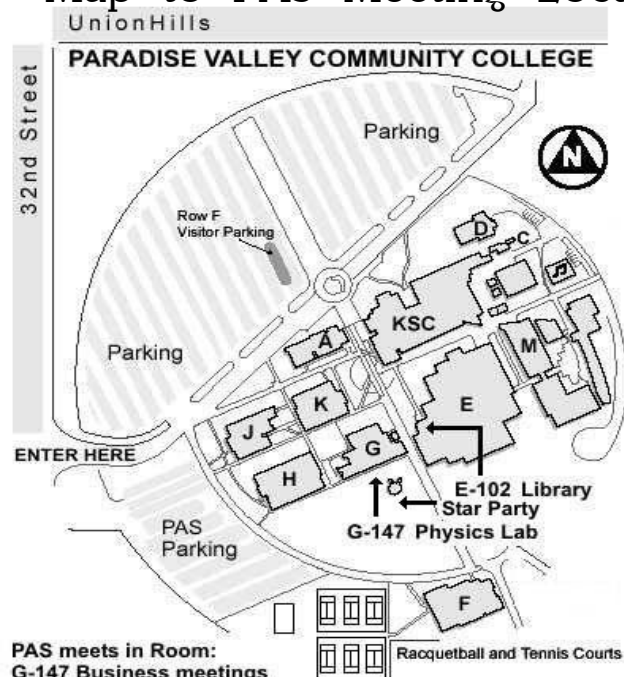
to the book and magazine astronomy section within Bookman's.

In all, I'd say it was a very successful afternoon. From this, we decided to hold another Telescope Training Workshop at PV Park on Mar 15th. Watch for details and RSVP for attendance for this event.

For dinner, Rod, Sue, William, Terri and Mike were seen at Carlos O'Briens.

Photos for this event can be seen at: <http://tinyurl.com/2v596u> for the next few months. Thank you to all our PAS Volunteers for their time, talent and knowledge.

Map to PAS Meeting Location



Black Canyon City Site



March 1 Saturday	Sundown to Moonrise	High Desert Park Jacie Lane Black Canyon City, AZ 85324	PAS 3rd Quarter Moon Star Party All are Welcome! \$2 per car donation request. RSVP with Barbara Hartman to attend.
March 6 Thursday	7 pm to 9:30 pm	Paradise Valley Comm. College 18401 N. 32nd St Phoenix, AZ 85032 Union Hills and 32nd St. Library	PAS General Meeting PAS General Meeting Steve Coe, Saguaro Astronomy Club, "Nebulae, observing and enjoying the clouds among the stars" + Book Signing
March 8 Saturday	Sundown to ?	Two Trees Observing Site See Sirius Lookers web site for more info, directions and map.	PAS Deep Sky Star Party -- Messier Marathon! RSVP with Barbara Hartman to attend. We are guests at this site so no white light of any kind. If you arrive after dark drive by parking lights only (but please get there before dark) and turn off your vehicles dome light.
March 14 Friday	5:00 pm to 9:30 pm	North Mountain Park visitors center	Come join PAS for a PUBLIC Star Party. RSVP is with Terri for attendance and to help out. Visible that night will be: Sunset 6:30, Moon, Mars, & Saturn and many other fainter objects.
March 15 Saturday	6 pm to 10 pm	Paradise Valley Park 40th and Union Hills Rd. Phoenix, AZ 85032	Bring your telescope and come learn how to use it by moonlight. This is a training event, NOT A PUBLIC STAR PARTY. Objects you will learn to find that night: 1st Quarter Moon, Mars, Saturn, & Orion Nebula & more. RSVP required with Terri. Weather Permitting
March 21 Friday	6 pm to	Paradise Valley Park 40th and Union Hills Rd.	PAS Public Full Moon Party*** Volunteers Needed ***Moon Treasure Hunt (see craters, mountains and valleys on Earth's only natural satellite - the Moon). RSVP
March 27 Thursday	7 pm to 10 pm	Paradise Valley Comm. College 18401 N. 32nd St Phoenix, AZ 85032 Union Hills and 32nd St. Room G-147	PAS Meeting of the Minds No children lease (business meeting)
March 28 Friday	5:30 To 9:30	Greenfield Elementary School 2550 E Elliot Rd Gilbert, AZ 85234	Greenfield Elementary School Star***Volunteers Needed*** RSVP with Rod
March 29 Saturday	Sundown to Moonrise	High Desert Park Jacie Lane Black Canyon City, AZ 85324	PAS 3rd Quarter Moon Star Party All are Welcome! \$2 per car donation request. RSVP with Barbara Hartman to attend. * Weather Permitting *
March 30 Sunday	4:30 pm to 6:30 pm	Bookman's Back room 8034 North 19th Avenue Phoenix, AZ 85021-5101	PAS Bookman's Free Indoor Telescope Workshop 19th Ave & Northern - Bookman's back room Come on by with your telescope, sky charts, questions and learn anything you wish to know about astronomy and telescopes at our FREE Telescope Workshop. R.S.V.P. is required by email to Terri Finch or by phone at 602-561-5398 to attend or help out.

Ads in PAStimes

Ads in PAStimes run for a month and may be renewed on a month by month basis, if submitted by deadline, space permitting. Ads in PAStimes are FREE to members all others are asked to make a small donation. Donations are to be sent to the Editor who will forward them to the Treasurer.

Many Many Thanks & a Few Ideas for Next Year's PAS Social

I wish to thank Rod and Sue for donating a bunch of really nice prizes to use for our games. That was very sweet of them. I also wish to thank Jerry, who covered the first place prize for the darts, and the main door prize. I wish to thank Kevin who added one door prize as well. You all made the night run very smoothly and fun for all involved.

I do wish to thank, a huge THANK YOU for the piano entertainment we had from Sam! Wow, I didn't know Sam could play so well. Awesome! We enjoyed it! The piano was out of tune and the acoustics in the location weren't the greatest but Sam made that piano sing. Thank you SAM!!!

Speaking of White Dwarf Gifts, I'd like to talk a moment about some complaints I got recently. Yes, we actually have some folks who weren't happy. There's at least always one, right? Anyway, here's what we had.... 2 years ago a gift was put into the White Dwarf Gift Exchange. It cost the purchaser \$1. I know this because we discussed it after the party. Well, one of the PAS members won that gift that year. This year, the gift was sent back, re wrapped and pretty. It was won by the one who originally gave it as a gift. Now, in my opinion, if you are going to give a \$1 gift one year and get it back the next, you have only yourself to blame for the lack of cost involved. We ask, and we have asked for many years now to put a \$20 limit on gifts. I'd say, the safe thing and the fair thing to do is spend up to \$20 including tax. So, the gift I gave this year, 3 of the 5 needed to cover the Wursts and the Finches, was a total of +\$60. Two of the gifts were over \$20 and one was a little over \$10 and there was tax. So, I feel I gave enough, money wise, in gifts and they were very nice gifts. In fact, the deal I made with William was that if I'm going to give one of those to PAS for the White Dwarf game, then I want one myself. So, I have the same thing up on my wall. Remember, the idea is to give a gift you would like to receive. So, when you receive a book or a few books that aren't Science, but might be Sci Fi, you might consider including Sci Fi books the next year, different ones or more to the batch, because if you are putting in something you want to receive, someone else is asking for Sci Fi books in return. Personally, I think this is a SCIENCE group, not a Sci Fi group and would prefer to have books related to science fact in the gifts. The other thing is that a few years ago I mentioned that if you are going to re gift,

that means return the gift you got last year, then put something extra in with it to bring it to \$20 that was spent for the gift you included. So, if you received, this year, the \$1 item mentioned above, put some extra, cool stuff with it if it isn't something you want to keep and be sure to spend the \$20. The original \$1 gift, should not be part of the total spent on the next year. It should just be added to the gifts given. The idea is to give a gift worth the amount requested from everyone. So, for next year, please consider, up to \$20 per gift, please no lower than \$15 to be fair, before tax. Make sure it is something really cool and useful to an astronomer. The eyepiece Bruce gave this year, and Kevin received, was an excellent idea. Those who have telescopes would definitely appreciate it. The other thing is that this year, the gifts were mostly very well disguised. I chose the biggest one thinking everyone would fight for it, but no one stole it from me after I took it. I was surprised. The idea is to fight for it.

The other idea I think we should do is that all Door Prizes should be wrapped. What I'm thinking is that, unless it is specified as ONLY for the Dart game, we should have wrapped door prizes and who ever wins one, chooses what they want to get. For the Table Decor prize, I chose who got what, but after I saw what they won, I decided next year will be random. We will have a table of prizes to choose from, and do all the awards first, leaving only the gifts left that will be door prizes. Door prize, recall, that is one prize given for attendance. You can't win it if you don't attend and aren't present at the time. Yea, I gave Chet one this year, because one of the tickets no one had so it had to be his. So, this year, he got one but in the future, you have to be present to win, and it is for attending the event to the end of the event.

Now, for the idea I had.... we had a little misunderstanding. Matt gave me a gift to put into the White Dwarf to be exchanged. Don and Chris didn't want to play the game, they were being the photographers. So, no one really took the place of Matt or Chet this time, as both brought gifts and couldn't stay or didn't make it to the party. But, at the end of the game we had 2 gifts on the table. I sent one home with Rod to give to Chet, and Jerry took the other one for Matt. So, for future games, here is what we will do. If you come to the Social, and you have looked at the schedule of events for that night (which I did post in the newsletter and

on line), and you see that you will not be able to stay the whole night for the games, please skip bringing a gift, unless you'd like the last gift on the table, meaning it was yours, to be either given to you in exchange or donated as a door prize. So, next year, if you can't stay for the game, please inform me if you would like to have a gift returned to you, knowing it will be the last one on the table, or that you'd like to donate it to the Door Prizes. We do door prizes at the end of our White Dwarf game.

Another thing that came to mind is that we started the dart game, and then I tried to get everyone's attention to vote on the table decorations. Well, that worked ok but it was a bit noisy and hard to let everyone know about it, so I think what we will do is announce the dart game and the voting on the table decorations at the same time, allowing everyone a chance to vote. The other idea is that we could designate a time frame for the voting, and post it, and announce it, and when the time is up, we tally whether you voted or not. Remember, you vote on your favorite top 3 table decorations. Some folk only chose one. I guess that's ok. We awarded the most votes. So, Chris had received the most votes of everyone, and that's how he got 1st place. In fact, Chris, Jerry and Kevin were the most voted items. No one else came close to their vote totals. I got 1 vote, Sam had 3 votes, oh and Bette's Singing Christmas tree had I think 6 votes, she would have gotten 4th place if we were awarding 4th place prize. It was a good game. Be thinking of what to bring next year.

Speaking of next year. I mentioned in the PAS Social review article in this issue that we are thinking of getting a different location. Let me review our situation. Rod found out that his parents could borrow, for the night, The Club House, with enough notice. So, last year, we got the same location we had this year. I found out from some of our members, in complaint mode, that they didn't like the location. Too hollow, too much room, what every the complaint was. But of course, they tell me this AFTER the plans were already made. Rod's parents are moving. They sold their home there and so we do not have the same location for next year. The other thing is that one of our members complained they don't like playing darts and would rather be playing pool. Ok, so what I got from that is that this person didn't attend the MOM's where we discussed what we were and were not

Many Many Thanks & a Few Ideas for Next Year's PAS Social

allowed to do at that location. We were told we can not use the pool table. In fact, I put that in the newsletter several times prior to last year's event. So, my choice of games were based on not having a pool table to use. So, I got to thinking... the next location we get for our PAS Social, we must know the rules ahead of time and I don't care if you want to complain about it or not, we follow the rules. When borrowing someone else's space, you follow their rules.

So, this is the plan for next year's event. Those who care to complain and want things different from this year, please attend the MOM's, especially when I announce we will be discussing what we are doing at the next PAS Social. Your input, obviously, was needed. I didn't get any, therefore I decided how the night will be. And really, if you are going to be upset about it, don't attend. It's that simple. I think everyone who attended, minus the complainers, enjoyed themselves. I hope to have another successful PAS Social next January, 2009, and I hope you will join us. I think some

people just think that these event HAPPEN. As if there was no planning involved, no hours of thinking through and making name tags, and planning how things are going to go and making sure, the whole night, that everyone there was having a good time. If you can't come give input as to the way the PAS Social might go in 2009, then don't complain about the party. I felt it was a great party, great fun, lots of cool people, and I want to do it again.

The dates that are open for next year's event are January 10, 17, 24, 31. If you have a location you'd like to hold it, such as your house, or some input about it for next year's event, drop me an email and let me know. I'm looking to have a different game for next year. Chris Johnson said we can use his home. I'm not sure if Darts will work at his place. We are thinking of having an early summer star party at his home to scout out the possibility of having the PAS Social there. You might want to attend to give your input. And he has a pool which might take up some of the room we'd like to use. But it

sounds like a good idea. His home is in Goodyear. For a party like this, it is worth the drive. Where else would you get such an awesome party with activities, food, fun, and people you share an interest with. See you there!

MANY THANKS goes to Ed, Bette, and Bruce for helping set up, and providing some gifts on the tables for the attendees to take home with them. The gifts were chocolate covered cherries and boxes of candy canes wrapped up.

I'd like to thank Rod, Sue, Merry, Carl, and Don for also helping to set up for the event! Your help was very appreciated and needed.

Also, I'd like to mention that we missed a few folks. Sonny, Barbara, Scotty, Bob, Dave, Olga, Greg Vera, Matt, David, James, John, Leah, Jane, Mark & Steve. These folks were all missing at our party. We've seen them at other events, but they missed this one.***

Special Event: Telescope Training Workshop 3/15

Bring your telescope and come learn how to use it by moonlight on 3/15/08 at PV Park - 40th Street and Union Hills Rd 6pm

to 10pm. This is a training event, NOT A PUBLIC STAR PARTY. Objects you will learn to find that night: 1st Quarter Moon,

Mars, Saturn, & Orion Nebula & more. RSVP required with Terri. Weather Permitting.

North Mountain Park Visitor Center Star Parties March 14

Come join PAS for a PUBLIC Star Party. This is the first of several in a series of events happening at North Mountain Park

Visitor Center, in the parking lot. Come join the fun, bring everyone you know. Volunteers needed! RSVP is with Terri for attendance and to help out. We begin at

5pm to catch the Sun and go till 9:30pm that night. Visible that night will be: Sun-set 6:30, Moon, Mars, & Saturn and many other fainter objects.

Mike Marron Presents 4 Fantastic Lectures

Date: Apr 26, 2008

Location: North Mountain Park Visitor Center on Apr 26 in the V.C.

Time: Star Party 5pm to 6pm for solar viewing, Presentation 6pm to 7:30pm, star party continues 7:30pm to 9:30pm.

Topic: Meteorites & Formation of the Solar System

Visible that night: Sun 5pm, Sunset 7pm. Venus 5pm, sets 6pm. Mercury visible 7pm, sets 8pm. Mars 7pm, Saturn 7pm. RSVP required with Terri for Lecture & Star Party. Volunteers needed for Star Party.

Dates: 2008 - June 28, Aug 2, Aug 30

Location: Mike's Home in Carefree

Time: 4pm to ?

Topics: Solar System, Stars, Galaxies

PAS Members welcome - Non Members contact Mike for invite & map.

PAS/PVCC Indoor Astronomy Event Apr 10, 2008 7:30pm to 9:30pm

By Terri, Events Coordinator

It is that time again when the public gets to come "Play" with the astronomy toys. We originally called this the "indoor" event and were planning to keep it to indoors only, but then it was really nice out side

last year when we did this event and we have since expanded it to include observing outdoors - Weather Permitting. Come play with hands on activities to help you understand Astronomy. All ages welcome. RSVP is required with Terri. Event is from

7:30pm to 9:30pm in G-147 on the PVCC Campus. Volunteers Needed for activities. ***

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What's Up For March?

By Rod Sutter, PAS President
Lunar Eclipse Wed 20th 20:29

Planets

Name	Date	Rise	Set
Mercury	03-1-08	05:34	16:32
Venus	03-1-08	05:41	16:21
Mars	03-1-08	12:26	02:53
Jupiter	03-1-08	03:49	13:51
Saturn	03-1-08	17:40	06:43
Uranus	03-1-08	07:17	18:55
Neptune	03-1-08	05:54	16:43
Pluto	03-1-08	02:28	13:02

All Times Arizona Time

Meteor Showers

NONE THIS MONTH

March 15 2008

Sunrise: 03:37

Sunset: 18:36



Q3: February 28



New: March 7



Q1: March 14



Full: March 21

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